MODULE 6
OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Describe the purpose for examining the lymphatic system at the time of slaughter.

2. Name the parts of the lymphatic system.

3. Describe the functions of the parts of the lymphatic system.

4. Name the lymph nodes that may be inspected depending on the species and inspection station (head, viscera, carcass)

Module 6
Script

The examination of the lymphatic system of the animal or carcass in meat inspection is very important in detecting abnormal conditions. If a disease is present, the function of the lymphatic system, related to the evidence found during the examination, aids in determining the stage to which the disease has progressed. Standard inspection procedures require the examination of specific lymph nodes and organs in order to detect abnormal and disease conditions. Animals and carcasses found with abnormalities-including abnormalities of the lymphatic system-must be segregated and examined by the veterinarian.

The lymphatic system is the first line of defense in protecting the body against disease. Many disease-causing microorganisms (pathogens) are retained and destroyed in lymph tissue. Some pathogens are retained and produce disease in the lymph node. Some pathogens pass through a node without leaving any trace of their passage. Particles of carbon may be filtered out and remain in the node. Blood and tissue pigments may be present due to tissue destruction somewhere upstream.

The lymphatic system consists of the following components:

1. The lymph;
2. The lymph vessels;
3. The lymph nodes; and
4. The accessory lymphatic structures.

The lymph is derived mainly from blood and its composition is similar to blood plasma. It passes from the thin wall of the blood capillaries into the tissue spaces. It carries nutritive matter from the blood to the body tissues and waste material from the tissues to the blood.

The lymph vessels consist of a system of tubes beginning in the tissue spaces as blind lymph capillaries and converging to form smaller, then larger vessels. The system of vessels terminates into two large vessels, the thoractic duct and the right lymphatic duct, which empties into the heart. The flow of lymph is sluggish and in one direction from the tissues to the heart because of:

1. The difference in pressure at the two ends of the system caused by higher pressure in the small vessels and lower pressure in the large vessels.
2. The massaging effect of muscular movements.
3. The valves in the larger vessels, which prevent backward flow of lymph. The right lymphatic duct receives lymph from the right foreleg and the right half of the neck, head, and thorax. The thoracic duct receives lymph from all other parts of the body.

A lymph node is a collection of specialized cells held together and separated by a tissue framework and surrounded by a thick capsule. An inspector often depends on the appearance of lymph nodes in

determining health or disease and in determining whether a disease condition is localized or generalized. The size and shape of lymph nodes varies. In young animals, they are yellowish-white, larger, and contain more fluid than in old mature animals, in which they are firm, compact, and fibrous. The nodes vary in color and consistency. Mesenteric nodes may vary from white to black and may be gray, brown, or red. Mottled, black, or white nodes are usually not diseased. Hemorrhage in a lymph node does not always indicate disease.

Other lymphatic structures include the spleen and lymph follicles. The spleen is rich in lymphatic tissues. It contains the largest concentration of lymph type tissue in the body. The spleen differs from other lymphatic structures in that the flow goes into the blood stream and not into the lymph. The spleen filters the blood the same as the lymph nodes filter the lymph. Lymph follicles are present in the intestines, soft palate, base of the tongue, tonsils, and posterior nares.

The last topic for discussion is the lymph nodes that require routine inspection per the MPI Manual. Inspection is classified as head, viscera, or carcass inspection. The head nodes that may

require inspection, depending on species requirements, include the mandibular, parotid, suprapharyngeal (medial retropharyngeal), and atlantal (lateral retropharyngeal).

The lymph nodes of the viscera that may require routine inspection include the mesenteric, hepatic, right and left bronchial (right and left tracheobronchial), posterior, middle, and anterior mediastinal (caudal, middle, anterior). The body nodes that may require inspection, depending on the species inspected, are the prescapular (superficial cervical), popliteal (deep popliteal), prefemoral (subiliac), superficial inguinal (scrotal), supramammary (mammary), internal iliac (medial iliac), lumbar (lumbar aortic), and renal lymph nodes.

Lymphatics Filmstrip

The following descriptions correspond to the lymphatics filmstrip.

Frame #1

An inspector depends on the appearance of the lymph nodes in determining health or disease and localization or generalization of a disease condition.

Frame #2

The shape and size of lymph nodes varies. They may be flat, round, cylindrical, or kidney shaped. They vary in size from small points to the size of a hen's egg.

Frame #3

Lymph nodes in young animals are larger and contain more fluid than lymph nodes in old mature

animals.

Frame #4

The consistency and color of lymph nodes vary.

Frame #5

Mesenteric nodes vary in color from white to black and may be gray, brown, or red.

Frame #6

Mottled, black, or white nodes are usually not diseased.

Frame #7

In many old animals the nodes are fibrous.

Frame #8

Nodes are a yellowish-white color in young animals.

Frame #9

Hemorrhage in a lymph node does not always indicate disease.

Frame #10

The spleen is rich in lymphatic tissues and contains the largest concentration of lymph tissue in the body.

Frame #11

Lymph follicles are found in the intestines, soft palate, base of the tongue, tonsils, and posterior nares.

Frame #12

Head nodes inspected-bovine.

Frame #13

Body nodes inspected-outside hindquarter.

Frame #14

Body nodes inspected-inside hindquarter.

Frame #15

Body nodes inspected-inside forequarter.

Frame #16

Body nodes inspected-outside forequarter.

Frame #17

Viscera nodes inspected-mesenteric.

Frame #18

Viscera nodes inspected-hepatic.

Frame #19

Viscera nodes inspected-lungs.